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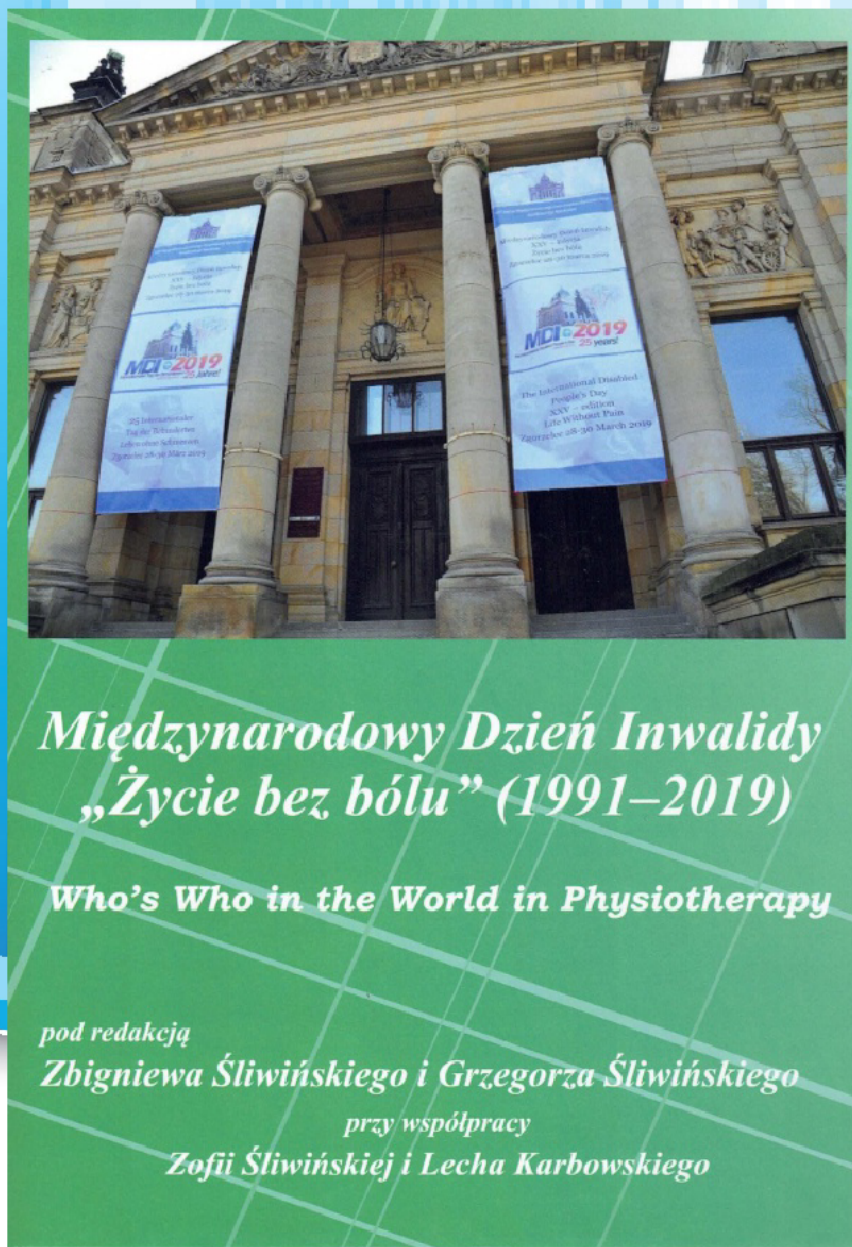
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The impact of magnetostimulation on the level of urinary incontinence among women after menopause

Wpływ magnetostymulacji na stopień nietrzymania moczu u kobiet po menopauzie

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Abstract

Urinary incontinence (UI) is according to ICS definition "every uncontrolled urine loss". Among the broadly understood definition, there are different types of UI: effort, urgent, from overflow, mixed, transitional, bedwetting and other types of UI. The most common type from mentioned is the effort urinary incontinence and the mixed one. Due to the complex nature of UI problem, there are many methods of diagnosis and treatment of incontinence. In conservative treatment, pelvic floor muscle exercises, physical therapy (including magnetic field) and behavioral therapy are commonly used. The aim of the study. The aim of work is to evaluate the impact of magnetostimulation and pelvic floor muscle exercises on the level of urinary incontinence among women after menopause. Material and methodology. The research was conducted among 30 women at the age of 45–67 years old (average \pm 56) who were treated because of UI in The Independent Public Health Care Centre named Primate Cardinal Stefan Wyszyński in Sieradz in the rehabilitation ward. The patients were divided into two groups – 15 people each. In the first group participants were tested by magnetostimulation and they were doing pelvic floor muscle exercises. In the second group they were only doing pelvic floor muscle exercises. The patients have been surveyed twice, before and after 3 weeks therapy. In the study two different questionnaires (A and B) were used. They were based on Gaudenza questionnaire. Results. According to the analysis of survey data, these are the following results. In the first group improvement concerned: reduction in the frequency of UI episodes and frequency of urination, less amount of „urine loss” and UI intensity based on daily physical activity, extending the time of the ability to control urination and better quality of life tested women. In the second group an improvement has been noticed according to subjective patient's feelings. All data analysis results from questionnaires were not statistically significant.

Conclusions. From the analysis of the results, the following conclusions have been drawn: 1. Combination therapy of magnetostimulation with pelvic floor exercises causes more beneficial effect than applying only exercises. 2. Subjective assessment of participants on how to improve ailments connected with UI, speaks in favour of therapy with the use of magnetic field stimulation. 3. The most common type of incontinence among tested women after menopause was the effort one. 4. Therapy with 3-weeks programme of magnetic field stimulation increases the level of satisfaction and improves well-being of people with UI.

Key words:

urinary incontinence, magnetostimulation, menopause, physiotherapy

Streszczenie

Nietrzymanie moczu (NM) to według definicji ICS „każda niekontrolowana utrata moczu”. Wśród szeroko pojętej definicji wyróżnia się różne postacie NM: wysiłkowa, nagła, z przepełnienia, mieszana, przejściowa, moczenie nocne oraz inne typy NM. Najczęstszą postacią wśród wymienionych jest typ wysiłkowego nietrzymania moczu oraz postać mieszana.

Ze względu na złożony charakter problemu NM istnieje wiele metod diagnostyki i leczenia inkontynencji. W leczeniu zachowawczym powszechnie stosuje się ćwiczenia mięśni dna miednicy, fizykoterapię (w tym pole magnetyczne) i terapię behawioralną. Cel pracy. Celem pracy jest analiza i ocena wpływu magnetostymulacji oraz ćwiczeń dna miednicy na stopień nietrzymania moczu u kobiet po menopauzie. Materiał i metodyka. Badania przeprowadzono u 30 kobiet w wieku 45–67 lat (średnia \pm 56) leczonych z powodu NM w Samodzielnym Publicznym Zakładzie Opieki Zdrowotnej im. Prymasa Kardynała Stefana Wyszyńskiego w Sieradzu na Oddziale Rehabilitacyjnym. Pacjentki zostały podzielone na dwie grupy po 15 osób. W grupie 1 badane zostały poddane magnetostymulacji oraz wykonywały ćwiczenia mięśni dna miednicy. W grupie 2 wykonywały tylko ćwiczenia mięśni dna miednicy. Pacjentki zostały poddane dwukrotnemu badaniu ankietowemu, przed rozpoczęciem i po 3-tygodniowej terapii. W badaniu wykorzystano dwie różne ankiety (A i B) opracowane na podstawie kwestionariusza Gaudenza.

Wyniki. Na podstawie analizy danych z ankiet uzyskano następujące wyniki: w grupie 1 poprawa dotyczyła: zmniejszenia częstości epizodów NM i częstotliwości mikcji, zmniejszenia ilości „gubionego moczu” i intensywności NM w oparciu o codzienną aktywność fizyczną, wydłużenia czasu możliwości opanowania parcia na moc oraz poprawy jakości życia badanych kobiet. W grupie 2 poprawę odnotowano w ocenie inkontynencji na podstawie subiektywnych odczuć pacjentki. Wszystkie wyniki analizy danych z ankiet były nieistotne statystycznie.

Wnioski. Z przeprowadzonej analizy wyników sformułowano poniższe wnioski: 1. Terapia skojarzona magnetostymulacji z ćwiczeniami dna miednicy wywołuje korzystniejszy efekt terapeutyczny niż stosowanie samych ćwiczeń. 2. Subiektywna ocena ankietowanych na temat poprawy dolegliwości związanych z NM przemawia na korzyść terapii z wykorzystaniem stymulacji polem magnetycznym. 3. Najczęstszym rodzajem inkontynencji u badanych kobiet po menopauzie była postać wysiłkowa. 4. Terapia z programem 3-tygodniowej stymulacji polem magnetycznym podnosi poziom zadowolenia z terapii oraz poprawia samopoczucie osób z NM.

Słowa kluczowe:

nietrzymanie moczu, magnetostymulacja, menopauza, fizjoterapia

Introduction

Urogynecology deals with lower urinary tract dysfunctions including static, pelvic floor disorders. It is especially common women disease in the menopausal period, which is often accompanied with hormonal disorders, changes in lipid panel and urinary incontinence [1, 2].

According to International Continence Society definition (ICS) from 2002, urinary incontinence (UI) is „every uncontrolled urine loss”. At present even the smallest incident of urinary incontinence found during the interview, allows to do specialized examination which confirms the diagnosis and qualifies to the appropriate kind of incontinence (urinary incontinence) [2].

Today urogynecology offers different ways of diagnostics and treatment of women who suffers from urinary incontinence. Choosing the right treatment method mostly depends on type and development of incontinence. Among methods of conservative treatment are: kinesitherapy (including pelvic floor muscle exercises with the use of biofeedback), behavioral therapy, physical treatments (electrostimulation, magnetostimulation) and pharmacotherapy [3, 4, 5]. As a result of conservative treatment failure or direct indications for surgery, surgical methods to combat oilments connected with urinary incontinence (UI) are used [5].

Selection of the adequate method of treatment depends on type of urinary incontinence and the level of its advancement. One of the elements of conservative therapy is the use of physical treatments and kinesitherapy for example magnetostimulation and pelvic floor muscle exercises. The effect on the degree of urinary incontinence is the subject of research of this article [5].

Urinary incontinence

The latest definition UI (according to the report ICS from 2002) is "every uncontrolled urine loss", differs from the previous one the fact that it takes into consideration hygienic – social aspects. Moreover the urine loss does not have to be documented objectively. [6] Currently even the smallest UI incident found during the interview allows to do specialized examination and classifies to the suitable type of incontinence [6, 7, 8]

In terms of clinical the most authoritative and precise is division due to the mechanism of the formation of this disfunction (fig. 1.) [6].

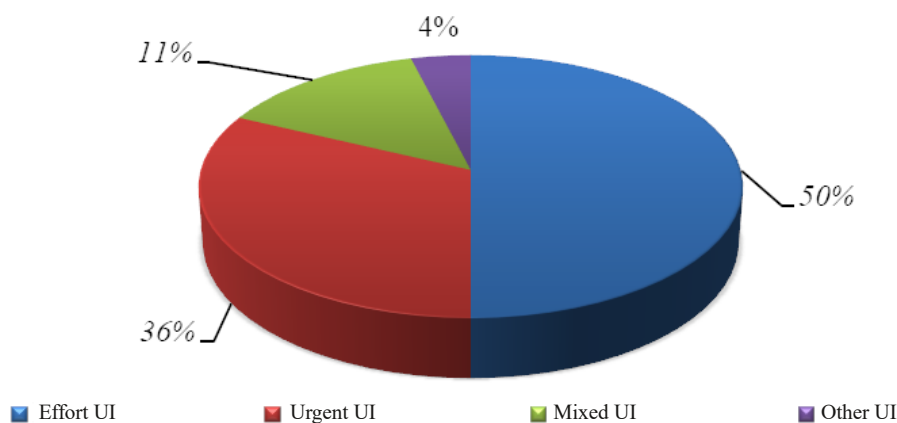


Figure. 1 Frequency of certain types of incontinence [6]

There is a close relation between the age and incontinence occurrence [7]. This disease has begun in the third and fourth decades of life [8, 9]. The disease appears most often in women at the age group 51–60 and 61–70 [9]. A significant increase in the UI occurrence of females' menopause is seen (fig. 2.) [9].

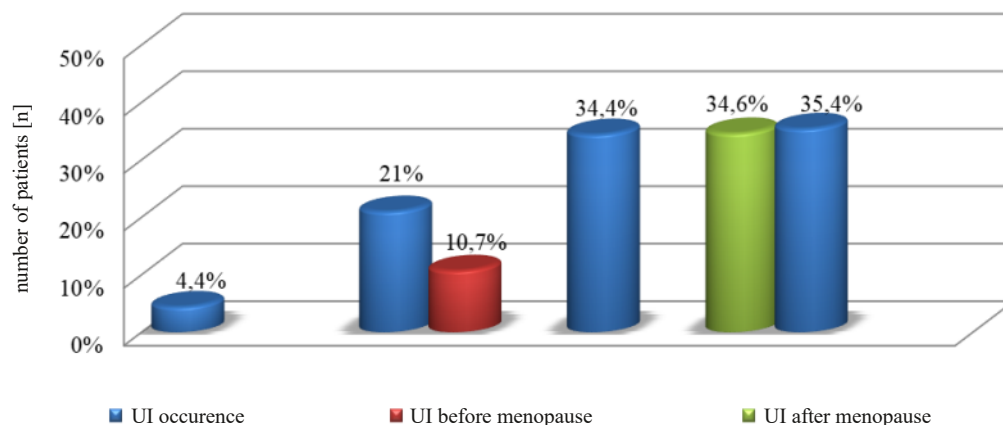


Figure. 2 UI occurrence depending on patients' age [9]

Goal and assumptions of the work

Nowadays urinary incontinence is becoming a common problem. According to WHO incontinence is treated as a social disease. Its incidence has risen up recently. A lot of women have hidden episodes of UI so far. Thanks to increasing number of publications in scientific and women's magazines. More and more women are deciding to go to the doctor and take treatment [9].

Diagnostic possibilities of on-call symptoms allow for thorough advanced assessment and define type of incontinence. There are many ways of treating people with UI, beginning from less invasive – behavioral therapy up to invasive surgical treatment. New branches of alternative treatment are arising (including conservative one), which can help to cope ourselves with incontinence. But there is no fully effective procedure, which could completely eliminate on-call symptoms [9].

The current research of low frequency magnetic fields on the human body has a significant influence on biological processes of the organism. The influence of magnetic field stimulation on problem hasn't been examined so far. Stimulation of labia of small pelvis enhance it by inducing muscle spasm. It reduces ailments [9].

The above- mentioned aspects made the authors of this work to put the following research problems:

1. Does magnetostimulation affect the reduction of pain (connected with UI) in women after menopause?
2. Is there a difference between the use of combined therapy (magnetostimulation and pelvic floor muscle exercises) and only the use of pelvic floor muscle exercises?
3. How do women assess the effectiveness of treatments used?
4. Assessment of patient's satisfaction from the use of magnetostimulation as an innovative method of conservative treatment.

The purpose of this work was to study the impact of magnetostimulation and pelvic floor exercises on size of ailments connected with women's UI after menopause.

Content and methodology

The study was conducted among 30 hospitalized patients in Independent Public Health Care Centre named Primate Cardinal Stefan Wyszyński. Two groups were distinguished. Each group consisted of 15 people. The first group were patients in which magnetostimulation and pelvic floor muscle exercises were applied. But the second tested group were patients in which pelvic floor muscle exercises were applied as the only form of therapy. The patients were involved in taking part in medical procedures every day for three weeks (15 medical procedures on average). The patients taking part in the study were between 44–68 years old. The average age in the first group was 56 whereas in the second group was 55.

The effectiveness of magnetostimulation conducted, was based on two completed by the patients questionnaires before and after finishing series of medical procedures. The survey concerned the impact of magnetostimulation on UI, taking into account patient's satisfaction from the therapy. Both surveys were based on Gaudenz questionnaire and used for UI evaluation.

First group patients-in which magnetostimulation was applied, were dressed and laid down on a big applicator with Viofor JPS®pillow (fig. 3.) [10]. In this group P3 programme and M3 application were used. The intensity of treatment was graded from 1 to 12. The time of medical procedure was for P3 programme – 12 minutes. The treatments were taken at the same time skipping afternoon hours. Its purpose was to avoid impaired concentration, irritation and sleeping disorders. Besides magnetostimulation, patients were doing pelvic floor muscle exercises according to the schema prepared by the author.

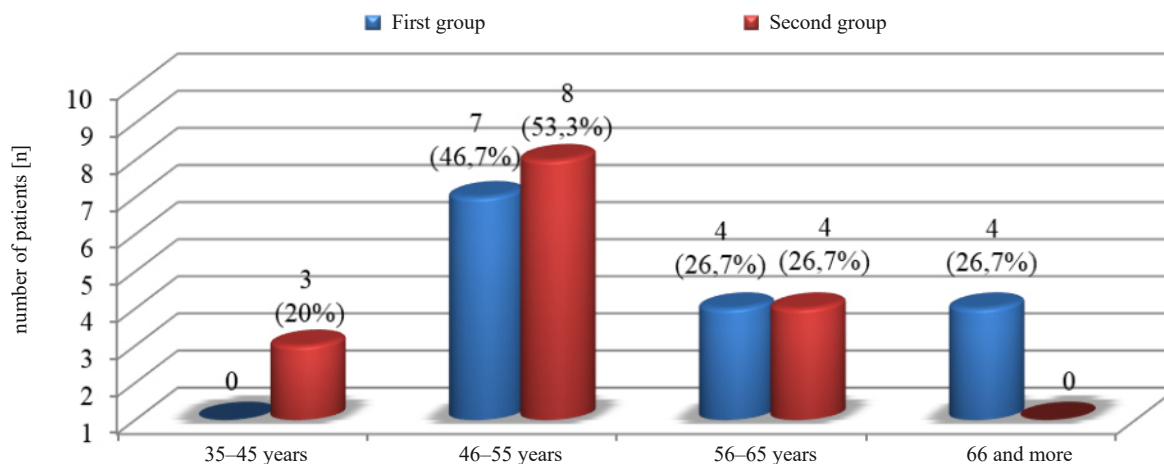


Fig. 3 Positioning of the patient during the magnetostimulation procedure [10]

Description of research results

In the research it turned out that the age range of the majority of participants is perimenopausal age (46–55 years old). (ryc.4) The dominant type was the effort one then the mixed one and the urgent one. Increased number of UI in women

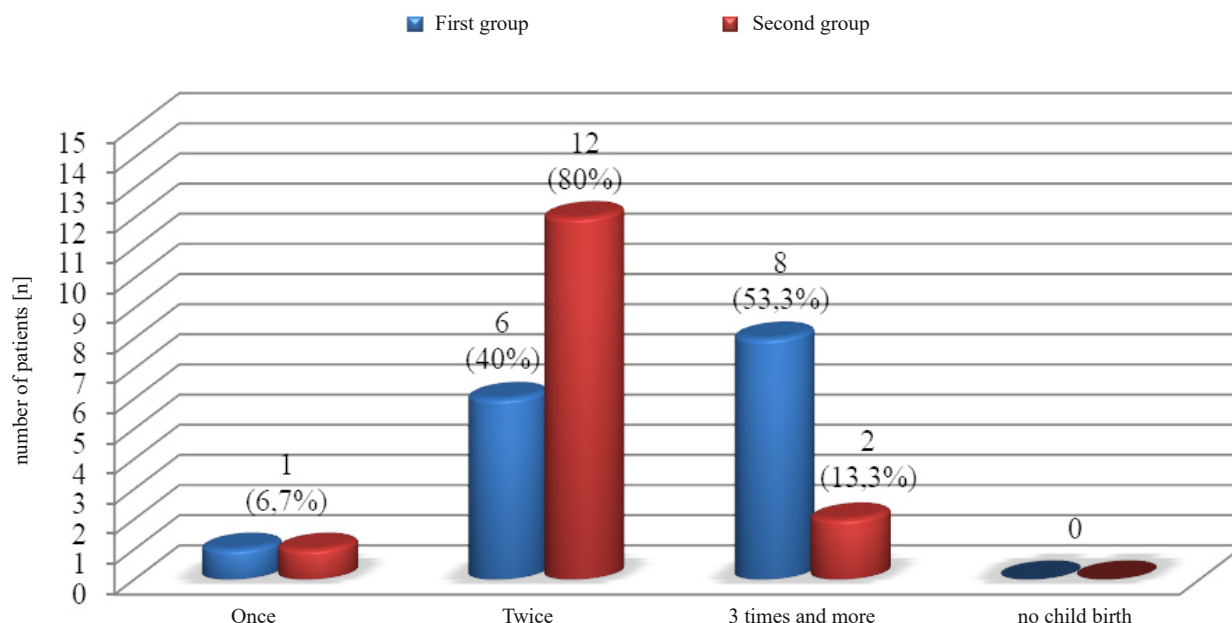
during the menopause suggests the effect of hyperestrogenism which causes changes in collagen structure and disorders of small pelvic statics weakening of muscle strength).



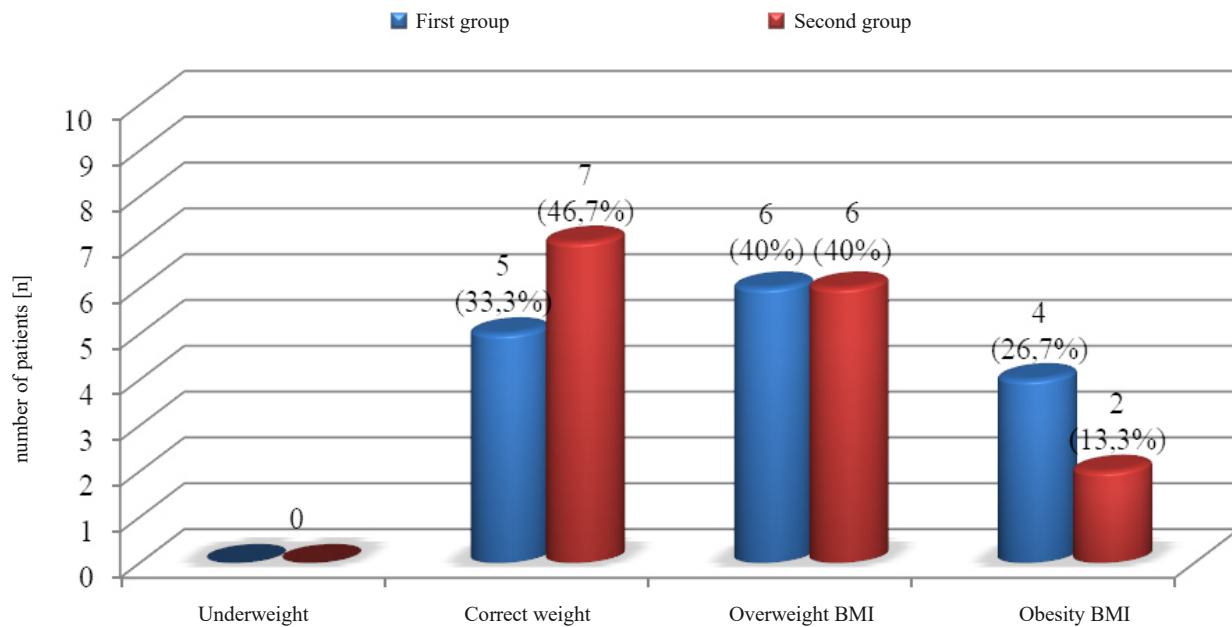
Ryc. 4. Struktura wieku osób badanych

Ryc. 4 Age structure of participants

By analysing UI risk factors, the most often besides the age are children births along the ways of nature especially with weight of newborns above 3500 g. Among all examined women with UI, most gave childbirth and went through 1 or 2 children births, Rest of patients went through the children births 3 or more times. Newborn weight above 3500 g appeared at least once, more often in the first group then in the second one (fig. 5). High physical activity was declared by 5 interviewees from both groups, from which 3 women from the first group were actively practising sports. BMI coefficient test among being tested, proved that UI appeared mostly in overweight women and the ones with correct weight [11, 12, 13, 14] (fig. 6).

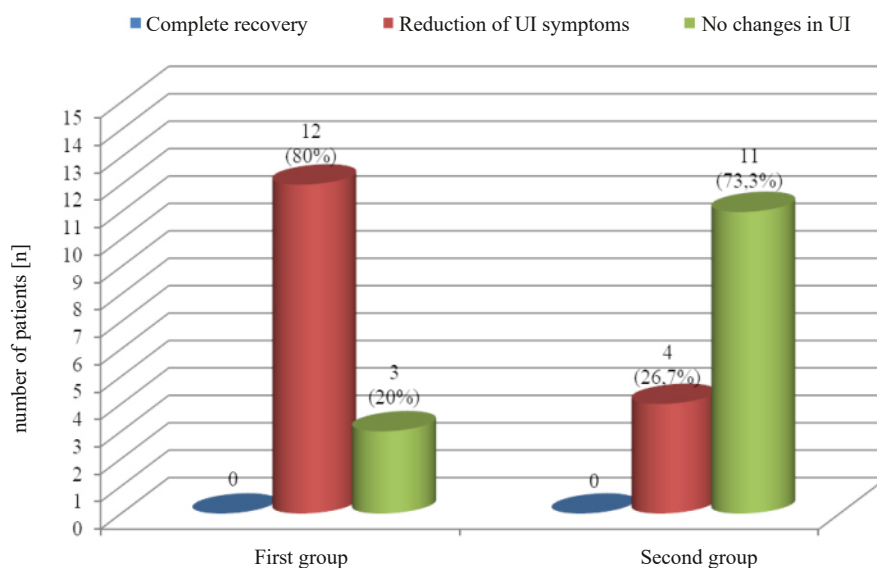


Ryc. 5. Children births among tested women



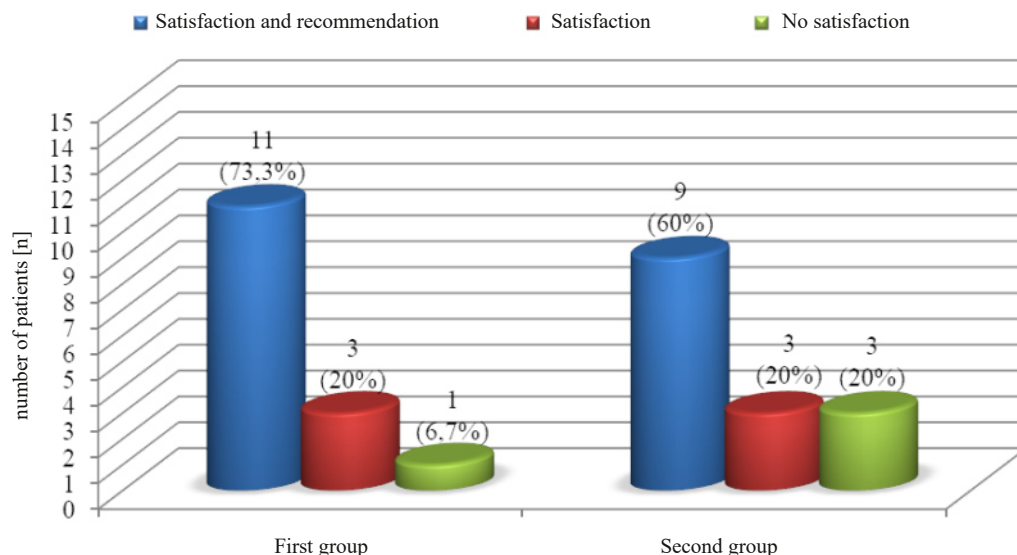
Ryc. 6 Body mass index among being tested

In the study Viofor JPS® magnetostimulation camera was used. Observed similar changes to the above mentioned. Reduction of on-call symptoms (frequency of UI incidents, amount of urine loss) in the first group was appearing more often than in the second group. Occurrence of involuntary urination after series of magnetostimulation and pelvic floor muscle exercises was less frequent. Amount of urination, frequency of miction and changing the underwear by the patients during the day slightly decreased (fig.7).



Ryc. 7 Improvement of incontinence on the basis of subjective patient's feeling

In the questionnaire there was a question about patients' satisfaction from the conducted therapy. In the first group satisfaction was indicated by most patients and some of them would recommend such therapy. Whereas in the second one satisfaction from therapy was less (fig. 8).



Ryc. 8. Patients' satisfaction in different groups

To assess the effects of magnetostimulation, it is important to take into consideration amount of treatments. In the first group 3 weeks series of 12 minutes field exposure was applied. For comparison in NeoControl®system treating UI, 8 weeks series of 20 minutes exposure are usually used [11, 13, 14].

In the researches of other authors, we can find similar therapeutic effect on positive impact of magnetostimulation, which decreases women's incontinence. Most of them were carried out among women with effort urinary incontinence [15, 16, 17]. The impact of magnetostimulation not only reduces the amount of UI episodes but improves quality and comfort of life in women affected with this problem. In this work has also compared the influence of pelvic floor muscle exercises with magnetostimulation. In the study of other authors, women in which it was impossible to apply exercises, magnetostimulation has also a positive impact on final effect, reducing at the same time on-call symptoms [15]. We can assume that the amount of treatment and series of magnetostimulation can have influence on therapeutic effect. Among patients in which combination therapy of magnetostimulation and exercises were used. Therapeutic effects were better [16]. Testing of UI incidents in this work was conducted according to Gaudenza questionnaire. The extent of incontinence advancement was stated in accordance with subjective patient's feelings. The author of present work recognized the superiority of this method over others due to the ease of execution while maintaining the patient's intimacy. The sanitary napkin test was also often

used. What is more, used in randomised controlled trials of magnetostimulation impact on the grade of UI researches of other authors, also suggests therapeutic effect of magnetostimulation [17].

Conclusions

1. Combination therapy of magnetostimulation with pelvic floor exercises causes more beneficial effect than applying only exercises.
2. Subjective assessment of participants on how to improve ailments connected with UI, speaks in favour of therapy with the use of magnetic field stimulation.
3. The most common type of incontinence among tested women after menopause was the effort one.
4. Therapy with 3 –weeks programme of magnetic field stimulation increases the level of satisfaction and improves well-being of people with UI.

A set of pelvic floor exercises for women with urinary incontinence

prepared by: Robert Kowalski

General rules for doing exercises:

- before the practice, empty the bladder
- don't tense your gluteal and abdominal muscles while exercising
- in the first stage of the treatment, do exercise on the inhale
- during the practice it is necessary to breathe deeply and to maximize tension in the area of pelvic floor muscle
- you shouldn't exercise during the use of restroom – the consequence may cause urinary tract infection

Introductory part

Pelvic floor muscle identification

Ex. 1. Starting position: The patient is sitting on a chair, slightly legs apart, with the trunk straightened, one upper limb along the trunk, and the other one is lying in the area of lunar symphysis.

Movement: During the provoked cough, try to feel the muscles contract above the symphysis pubis.

Final position = Starting position

Ex. 2. Starting position: as in exercise 1

Movement: Attempt to tighten the sphincters of both the urethra and the anus (as if the patient wanted to refrain from urinating). The position of hand in the perineal area.

Final position = Starting position

Ex. 3. Starting position: Sit on the table corner. Lower limbs slightly apart. A hand of one upper limb rests on the perineum or the symphysis pubis.

Movement: While the muscles tension in the area of urethra and anus, there is an attempt to feel muscle contraction.

Final position = Starting position

Ex. 4. Starting position: Standing position, upright torso lower limbs slightly straddling, a hand of one upper limb rests on the symphysis pubis and the other hand on the coccyx. Movement: Pelvic floor muscle tension as if the patient would like to bring the coccyx closer to the navel. Final position = Starting position

Ex. 5. Starting position: Free standing position. The hands rest on the buttocks in the area of the sciatic tumors. Movement: Squeeze buttocks. As you bring the sciatic tumors inward, try to feel the Kegel muscles. Final position = Starting position

If the above-mentioned exercises do not help in identification, the following attempts can be used:

- An attempt to stop urination while emptying the bladder.
The procedure is used only in the identification of muscles. It should not be used as an exercise as long-term use may cause urinary tract infections.

- Attempting to refrain from urinating when the patient feels the physiological need to urinate.

We repeat the exercises from the main part 5 times in the cycle. We perform 3 cycles during the day. We change the number of repetitions in the cycle by 5 times more compared to the previous one after a week of exercise. In the third week of therapy, the number of contractions in the cycle is 15. As a difficulty, in the second week, you can change the rhythm of breathing to inhalation during contraction in order to make the exercise more difficult, and in the third week, do this exercise while standing.

Main part

Exercise 1, 2, 3, 4, 5, 6 are repeated 5 times in the cycle.

Ex. 1. Starting position: Lying down on the back with the lower limbs bent at the knee joints. Feet resting on the ground, hip-width apart. Upper limbs along the body. Movement: The patient contracts the pelvic floor muscles with a simultaneous retraction of the abdomen and an attempt to pull the pelvis up for 5 seconds. Contraction performed with exhalation. Final position: Return to the starting position while inhaling. Resting time 5 s.

Ex. 2. Starting position: Lying on your back with your legs bent at the knee joints. Feet resting on the ground, hip-width apart. Upper limbs along the body. Movement: Strong, marking contraction of the pelvic floor muscles with pelvic movement as if the patient would touch the symphysis to the navel, with simultaneous exhalation (without lifting the lumbar spine from the ground). Final position: Relaxing and returning to the starting position while inhaling.

Exercise 3 is repeated 5 times on both sides.

Ex. 3. Starting position: Lying on the right side. Left lower limb bent at the knee joint at an angle of 90°, left foot resting on a pillow at the back.

Movement: Strong contraction of the pelvic floor muscles while drawing the abdomen in and trying to pull the pelvis up to the navel while exhaling.

Final position: Relaxing and returning to the starting position while inhaling.

Ex. 4. Starting position: Lying on your back with your legs bent at the knee joints. Feet hip-width on the ground. Upper limbs along the body. The pelvic floor muscles are tense as described in exercise 1.

Movement: Raising the pelvis about 5 cm and set aside your pelvis left then right.

Final position = Starting position

Ex. 5. Starting position: Lying down with straight lower limbs, crossed at the knee joints. The upper limbs are straightened along the body.

Movement: Pelvic floor muscles contract for 5 seconds while exhaling.

Final position: Relaxing and returning to the starting position while inhaling.

Ex. 6. Starting position: Lying down with lower limbs bent at the knee joints at an angle of 90°, feet resting by the wall.

Movement: With an exhalation, the patient "presses" the wall alternately, one and the other leg then both of them with the contraction of the pelvic floor muscles.

Final position: Relaxation and return to the starting position.

The following exercises require a small ball, pillow, or rolled up towel.

Exercise 7, 8, 9, 10, 11, 12, 13, 14, repeat 8 times in the cycle.

Ex. 7. Starting position: Lying on your back with your legs bent at the knee joints a pillow or a ball between the knees. The feet are hip-width apart. Upper limbs along the body. Movement: Raising the hips and torso so that the torso and thighs form a single line. By lifting your hips, gently squeeze the pillow between your knees, pulling it gently towards the navel, exhaling and contracting the pelvic floor muscles at the same time.

Final position: Relaxation, return to the starting position with inhalation.

Exercise 8 is repeated 5 times on both sides.

Ex. 8. Starting position: Lying down on the right side. Lower limbs bent at the knees. A towel or pillow between the knees. Upper limbs along the body.

Movement: Exhale with gentle squeezing of the pillow or towel with your knees and simultaneously pulling the navel inside, as if "sticking" it to the spine (the exercise takes place with the simultaneous contraction of the pelvic floor muscles as described in exercise 1)

Final position: Relaxation of inhalation and return to starting position.

Ex. 9. Starting position: Deep squat with lower limbs wide apart. The hands are resting on the feet. Buttocks and muscles of the anus and perineum relaxed.

Movement: Inhale in three short inhalation with simultaneous contraction of perineal muscles, then exhale in 4 short exhalations with simultaneous 4 contractions of pelvic floor muscles.

Final position = Starting position

Ex. 10. Starting position: Position on all fours. The head rests on the hands, the knees are wider than the width of the hips.

Movement: Tension the muscles of the perineum and making slow circular movements of the hips. 10 x one way and 10 x the other. Breathing deeply.

Final position = Starting position

Ex. 11. Starting position: Sit with lower limbs straight slightly apart in external rotation. Straight torso.

Movement: Pelvic floor muscle contraction with simultaneous internal rotation of the lower limbs and exhalation

Final position: Relaxing and returning to the starting position with inhalation.

Ex. 12. Starting position: Sitting on the chair. The torso is straight and slightly tilted forward. Upper limbs rest on thighs or knees. Look straight ahead.

Movement: Pelvic floor muscle contraction while exhaling.

Final position: Relaxation, return to the starting position with simultaneous inhalation

Ex. 13. Starting position: Standing position. Lower limbs slightly spread apart. Upper limbs resting on the buttocks with crossed hands. Torso upright.

Movement: Exhale - the pelvic floor muscles contract

Final position: Inhale - return to the starting position.

Exercise 14 can be modified for example instead of trying to cough, raise chairs or other object. Exercise helps to control urination during daily activities.

Ex. 14. Starting position: Standing position. Lower limbs slightly spread apart. The palm of one hand rests near the symphysis pubis.

Movement: Pelvic floor muscle strain while trying to cough.

Starting position = Final position

Final part

Exercises in the field of relaxing and breathing exercises. Note to the correct path and way of breathing (inhale through the nose, exhale through the mouth 2x longer than inhalation). Instructions for the patient on how to deal with urinary incontinence as a behavioral therapy, for example introducing appropriate voiding times, extending the intervals between micturitions, and if necessary introducing a voiding diary to visually present the amount and frequency of urination.

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